an impact along at least one direction of the oscillating direction and the detecting direction so as to prevent the impact from being transferred to the oscillator from the substrate.

IN THE CLAIMS:

Please replace claims 1, 2, 4-11 with the following claims:

1. An angular velocity sensor comprising:

a substrate;

an oscillator disposed on the substrate so as to be displaceable relative to the substrate; and

impact damping mechanism disposed on the substrate for dampening the effect on oscillations of the oscillator from an impact to the substrate; wherein

said impact damping mechanism is defined by a single unitary member including a portion for damping in a Y-direction and a portion for damping in an X-direction.

2. An angular velocity sensor comprising:

a substrate;

an impact damping mechanism disposed on the substrate for damping an impact applied to the substrate;

an oscillator supported on the substrate by at least one oscillator support beam, such as to be displaceable in two directions parallel to the substrate and orthogonal to each other;

oscillation-generating mechanism for oscillating the oscillator in an oscillating direction parallel to one of the two directions; and

angular-velocity detecting mechanism for detecting a displacement of the oscillator as an angular velocity when the oscillator is displaced in a detecting direction orthogonal to the oscillating direction,

wherein the impact damping mechanism damps an impact to the substrate along at least one direction of the oscillating direction and the detecting direction so as to prevent the impact from being transferred to the oscillator from the substrate;

the impact damping mechanism is formed of a frame support beam disposed on the substrate and a frame supported to the substrate by the frame support beam so as to displaceable in at least one of the oscillating direction and the detecting direction, and wherein the oscillator is supported on the inside of the frame via the oscillator support beam such as to be displaceable in both of the oscillating direction and the detecting direction; and

the substrate is provided with a support section arranged outside the frame so as to surround the frame for supporting the frame via the frame support beam and wherein the impact damping mechanism includes a damping clearance portion arranged between the support section and the frame for compressing a gas when the frame is displaced.

4. An angular velocity sensor comprising:

a substrate;

an impact damping mechanism disposed on the substrate for damping an impact applied to the substrate;

an oscillator supported on the substrate by at least one oscillator support beam, such as to be displaceable in two directions parallel to the substrate and orthogonal to each other;

oscillation-generating mechanism for oscillating the oscillator in an oscillating direction parallel to one of the two directions; and

angular-velocity detecting mechanism for detecting a displacement of the oscillator as an angular velocity when the oscillator is displaced in a detecting direction orthogonal to the oscillating direction,

wherein the impact damping mechanism damps an impact to the substrate along at least one direction of the oscillating direction and the detecting direction so as to prevent the impact from being transferred to the oscillator from the substrate;

the impact damping mechanism is formed of a frame support beam disposed on the substrate and a frame supported to the substrate by the frame support beam so as to displaceable in at least one of the oscillating direction and the detecting direction, and

wherein the oscillator is supported on the inside of the frame via the oscillator support beam such as to be displaceable in both of the oscillating direction and the detecting direction; and

the oscillator support beam, and the frame have an entire resonant frequency which is set to be $1/\sqrt{2}$ times more than or less than a resonant frequency of the oscillator.

5. An angular velocity sensor according to claim 4, wherein the substrate is provided with a support section arranged outside the frame so as to surround the frame for supporting the frame via the frame support beam and wherein the impact damping mechanism includes a damping clearance portion arranged between the support section and the frame for compressing a gas when the frame is displaced.

6. An angular velocity sensor according to any one of claims 1, 2 or 4, wherein the oscillator is formed to be displaceable in an oscillating direction parallel to the substrate and in a detecting direction orthogonal to the substrate, and wherein the impact damping mechanism is formed so as to damp an impact in the oscillating direction and to prevent the impact from being transferred to the oscillator from the substrate.

7. An angular velocity sensor according to any one of claims 1, 2 or 4, wherein the oscillator is formed to be displaceable in oscillating and detecting directions parallel to the substrate and orthogonal to each other, and wherein the impact damping mechanism is formed so as to damp an impact in at least one direction of the oscillating and detecting directions and to prevent the impact from being transferred to the oscillator from the substrate.

8. An angular velocity sensor according to anyone of claims 1, 2 or 4, wherein the oscillator, the oscillator support beam, and the impact damping mechanism are unitarily formed by a single-crystalline or polycrystalline silicon material.

9. An angular velocity sensor according to claim 5, wherein the oscillator, the oscillator support beam, and the impact damping mechanism are unitarily formed by a single-crystalline or polycrystalline silicon material.

10. An angular velocity sensor according to claim 6, wherein the oscillator, the oscillator support beam, and the impact damping mechanism are unitarily formed by a single-crystalline or polycrystalline silicon material.

11. An angular velocity sensor according to claim 7, wherein the oscillator, the oscillator support beam, and the impact damping mechanism are unitarily formed by a single-crystalline or polycrystalline silicon material.

Please cancel claim 3 without prejudice or disclaimer of the subject matter contained therein.